CLAIMS

1. (Currently amended) A method that restores communication in a mesh network between a first end node and a second end node, comprising:

transmitting a communication signal over a first communication path comprising the first end node, the second end node and one or more first intermediate nodes;

detecting an error condition at at least one of the first end node and the second end node, said error condition being not adjacent to said at least one end node; and

said at least one end node initiating rerouting the communication signal over a second communication path based on the detected error condition in order to restore communication, the second path having been ~~determined~~ chosen, before the error condition ~~is~~ was detected, to carry the rerouted communication signal and the second path including the first end node, the second end node, and one or more second intermediate nodes, wherein the second intermediate nodes are disjoint from the one or more first intermediate nodes;

the second path further including one or more transmission lines each having a plurality of channels, at least one said channel being assigned, after the error condition is detected, to carry the communication signal.

2. Canceled.

3. (Previously presented) The method of claim 1, further comprising sending one or more back-off commands to release at least one channel that had been assigned, after the error condition had been detected, to carry the communication signal.

4. (Previously presented) The method of claim 1, wherein the first and second end nodes coordinate rerouting the communication signal over the second path.

5. (Original) The method of claim 1, wherein the mesh network is an optical mesh network.

6. Canceled.

7. (Previously presented) The method of claim 1, wherein the step of rerouting the communication signal includes

issuing commands, after the error condition is detected, in a direction from the first end node to at least one of the second intermediate nodes to bi-directionally assign channels in at least one of said transmission lines, and

issuing commands, after the error condition is detected, in a direction from the second end node to at least one of the second intermediate nodes to bi-directionally assign channels in at least one of said transmission lines.

8. (Previously presented) The method of claim 1, wherein the step of rerouting the communication signal includes:

responding to a failure indication sent from the first end node to the second end node by issuing commands from the second end node to the one or more second intermediate nodes to bi-directionally assign channels along the second path.

9. (Previously presented) The method of claim 1, wherein the step of rerouting the communication signal includes issuing commands from the first end node to the one or more second intermediate nodes to unidirectionally assign channels along the second path in a first direction.

10. (Previously presented) The method of claim 9, wherein the step of rerouting the communication signal further includes issuing commands from the second end node to the one or more second intermediate nodes to unidirectionally assign channels along the second path in a second direction.

11. (Original) The method of claim 1, wherein the mesh network is a synchronous optical network (SONET) defined by the ANSI T1.105.

12. (Previously presented) The method of claim 1, wherein channels are assigned to carry the communication signal over the second path using a contention technique.

13. (Currently amended) A mesh network having a first end node and a second end node, comprising:

a first communication path that transmits a communication signal, the first communication path including the first end node, the second end node and one or more first intermediate nodes;

an error detecting device in at least one of the first end node and the second end node for detecting the occurrence of an error in any portion of said first communication path; and

a predetermined second communication path that is ~~determined~~ chosen, before the error detecting device detects an error condition, ~~and that transmits~~ to transmit the communication signal ~~after~~ in the event that the error detecting device detects ~~the~~ an error condition, the predetermined second path comprising the first end node, the second end node, and one or more second intermediate nodes, wherein the second intermediate nodes are disjoint from the one or more first intermediate nodes;

the second path further including one or more transmission lines each having a plurality of channels, and at least one said channel being assigned, after the error condition is detected, to carry the communication signal.

14. Canceled.

15. (Previously presented) The mesh network of claim 13, wherein the communication signal is rerouted from the first path to the second path based on an error condition detected by the error detecting device.

16. (Previously presented) The mesh network of claim 13, wherein the communication signal is rerouted from the first path to the second path based on a communication of the second end node.

17. (Previously presented) The mesh network of claim 13, wherein the first end node responds to an error condition by issuing commands to the one or more second intermediate nodes to unidirectionally assign channels along the second path in a first direction.

18. (Previously presented) The mesh network of claim 17, wherein the second end node responds to the error condition by issuing commands to the one or more second intermediate nodes to unidirectionally assign channels along the second path in a second direction.

19. (Currently amended) The mesh network of claim 13, wherein the mesh network ~~uses~~ is a synchronous optical network (SONET) defined by the ANSI T1.105.

20. (Previously presented) The mesh network of claim 13, wherein one or more channels of at least one of said transmission lines are assigned to carry the communication signal using a contention technique.

21. (Currently amended) A method for rerouting communications between first and second nodes of a mesh network upon a failure in a first path between the first and second nodes, the method comprising rerouting the communications over a second path ~~identified~~ that was chosen, prior to ~~said~~ a failure, to carry the communications in the event of a failure, the second path being node and span disjoint from the first path and the communications in the second path being carried over at least one assigned channel in at least one transmission line between at least one pair of nodes of the second path, said rerouting including assigning said at least one channel after said failure occurred.

22. (Previously presented) The method of claim 21 wherein said assigning further includes

assigning bi-directional channels in transmission lines of the second path in a direction from the first node toward the second node and concurrently assigning bi-directional channels in transmission lines of the second path in a direction from the second node toward the first node.

23. (Previously presented) The method of claim 21 wherein the mesh network is an optical network.

24. (Previously presented) The method of claim 21 wherein the mesh network is a synchronous optical network (SONET) defined by ANSI T1.105.

25. (Currently amended) A method for use in a mesh network comprising nodes interconnected by links, the method comprising:

establishing a first communication path from a first node to a second node, the first communication path including at least two of said links and at least one intermediate node;

directing communications traffic from the first end node to the second end node over the first path; and

responsive to a failure in the first path, rerouting the traffic to a second communication path that had been identified prior to said failure as being the path over which the traffic would be rerouted in the event of a failure in the first path, the second path including at least two of said links and at least one intermediate node, the second path being node and span disjoint from the first path, and the traffic over the second path being directed over at least one assigned channel within a multichannel link of the second path that was assigned subsequent to said failure.

26. (Previously presented) The method of claim 25 wherein said rerouting includes

assigning bi-directional channels in links of the second path in a direction from the first node toward the second node and concurrently assigning bi-directional channels in transmission lines of the second path in a direction from the second node toward the first node.

27. (Previously presented) The method of claim 25 wherein the mesh network is a synchronous optical network (SONET) defined by ANSI T1.105.

28. (Currently Amended) A method for use in a mesh network comprising nodes interconnected by transmission lines, at least two of the transmission lines being capable of carrying communication traffic in a plurality of channels, the method comprising:

establishing a first communication path between a first node and a second node, the first communication path including at least two of the transmission lines and at least one intermediate node;

directing communications traffic from the first end node to the second end node over assigned channels of the transmission lines in the first path; and

responsive to a failure in the first path, rerouting the traffic over assigned channels in the transmission lines of a second communication path between the first node and the second node, the second communication path having been ~~identified~~ chosen prior to said failure as being the path over which said communications traffic would be directed in the event of a failure in the first path, the second path having at least one intermediate node, the second path having no intermediate nodes or transmission lines in common with the first path, and at least one of the channels in the transmission lines of the second path being assigned subsequent to said failure.

29. (Previously presented) The method of claim 28 wherein said rerouting includes

assigning bi-directional channels in transmission lines of the second path in a direction from the first node toward the second node and concurrently assigning bi-directional channels in transmission lines of the second path in a direction from the second node toward the first node.

30. (Previously presented) The method of claim 28 wherein the mesh network is a synchronous optical network (SONET) defined by ANSI T1.105.

31. (Currently amended) A node for use as a first node in a mesh network of a type in which communications signals between said first node and a second node of said network over a first path through said network are rerouted over a second path through said network upon a failure in said first path, said second path having been identified prior to said failure as being the path over which said communications signals would be rerouted in the event of a failure in said first path, the second path being node and span disjoint from the first path, said first node being arranged to initiate, after said failure in said first path, an assignment of channels, within links connecting pairs of nodes in the second path, to carry said communications signals.

32. (Previously presented) The invention of claim 31 wherein an identification of said second path is stored in said first node.

33. (Previously presented) The node of claim 32 wherein said assignment includes

assigning bi-directional channels in links of the second path in a direction from said first node toward the second node irrespective of whether said second node has initiated concurrent assignment of bi-directional channels in links of the second path in a direction from the second node toward said first node.

34. (Currently amended) A method for use by a first node in a mesh network of a type in which communications signals between said first node and a second node of said network over a first path through said network are rerouted over a second path through said network upon a failure in said first path, said second path having been identified prior to said failure as being the path over which said communications signals would be rerouted in the event of a failure in said first path, the second path being node and span disjoint from the first path, said method comprising initiating, after said failure in said first path, the assignment of channels, within links connecting pairs of nodes in the second path, to carry said communications signals.

35. (Previously presented) The invention of claim 34 wherein an identification of said second path is stored in said first node.

36. (Previously presented) The node of claim 35 wherein said assignment includes

assigning bi-directional channels in links of the second path in a direction from said first node toward the second node irrespective of whether said second node

has initiated concurrent assignment of bi-directional channels in links of the second path in a direction from the second node toward said first node.

37. (Currently Amended) A computer-readable medium on which are stored instructions that, when executed by one or more nodes in a mesh network, carry out a method for rerouting communications between first and second nodes of the network upon a failure in a first path between the first and second nodes, the method comprising rerouting the communications over a second path identified prior to said failure as being the path over which said communications would be rerouted in the event of a failure in the first path, the second path being node and span disjoint from the first path and the communications in the second path being carried over at least one assigned channel in at least one transmission line between at least one pair of nodes of the second path, said rerouting including assigning said at least one channel after said failure occurred.

38. (Previously presented) The computer-readable medium of claim 37 wherein said method carries out said rerouting by assigning bi-directional channels in transmission lines of the second path in a direction from the first node toward the second node and concurrently assigning bi-directional channels in transmission lines of the second path in a direction from the second node toward the first node.

39. (New) The method of claim 21 wherein said first and second nodes are the end nodes of said first and second paths, wherein at least one of said first and second end nodes is adapted to determine when failures occur in portions of said first path that are adjacent to said at least one end node and in portions of said first path that are not adjacent to said at least one end node, and wherein said rerouting is initiated by said at least one end node.

40. (New) The method of claim 25 wherein said first and second nodes are the end nodes of said first and second paths, wherein at least one of said first and second end nodes is adapted to determine when failures occur in portions of said first communication path that are adjacent to said at least one end node and in portions of said first communication path that are not adjacent to said at least one end node, and wherein said rerouting is initiated by said at least one end node.

41. (New) The method of claim 28 wherein said first and second nodes are the end nodes of said first and second communication paths, wherein at least one of said first and second end nodes is adapted to determine when failures occur in portions of said first communication path that are adjacent to said at least one end node and in portions of said first communication path that are not adjacent to said at least one end node, and wherein said rerouting is initiated by said at least one end node.

42. (New) The method of claim 31 wherein said first and second nodes are the end nodes of said first and second paths, and wherein said first node is adapted to determine when failures occur in portions of said first path that are adjacent to said at least one end node and in portions of said first path that are not adjacent to said first node.

43. (New) The method of claim 34 wherein said first and second nodes are the end nodes of said first and second paths, and wherein said first node is adapted to determine when failures occur in portions of said first path that are adjacent to said at least one end node and in portions of said first path that are not adjacent to said first node.

44. (New) The method of claim 37 wherein said first and second nodes are the end nodes of said first and second paths, wherein at least one of said first and

second end nodes is adapted to determine when failures occur in portions of said first path that are adjacent to said at least one end node and in portions of said first communication path that are not adjacent to said at least one end node, and wherein said rerouting is initiated by said at least one end node.